



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,043	10/21/2003	Li Yao	063254-0151US	4499
9629 7590 12/23/2008 MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004				
EXAMINER				
ALANKO, ANITA KAREN				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
12/23/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/689,043

Applicant(s)

YAO ET AL.

Examiner

Anita K. Alanko

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-5, 7-10, 14, 16, 18, 19, 21, 24-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-5, 7-10, 14, 16, 18, 19, 21, 24-26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-849)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/2/08 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-5, 7-9, 14, 16, 19, 21, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al (US 7,008,554 B2).

Tsai discloses a method comprising:

providing a substantially abrasive-free (since abrasives are optional, “may further include” is interpreted to mean that it may not include, col. 6, lines 17-18, alternatively, or the cited range of less than 1 wt% overlaps with Tsai’s range of 0.01-2 wt%, col.7, line 67) CMP composition that includes a hydroxylamine derivative (1%, col.6, lines 49-51), a corrosion inhibitor (0.02% BTA, col. 7, lines 50-60), and water (col.8, line 8);

contacting the composition with a substrate 400 having a metal oxide surface 410 (col.9, line 64-col.10, line 34), upon which metal oxide surface a metal layer 413 (copper) is disposed;

chemically mechanically polishing the substrate by contacting the substrate surface with a polishing pad 300 at an applied pressure of 2 psi (including a range of 1-2 psi, col.6, lines 6-7) and by moving the pad in relation to the substrate.

As to claim 16, Tsai teaches barrier removal rates (about 500 angstroms/min) and selectivities to metal (copper) polishing of 5:1 or greater (col.8, line 52). If the selectivity is 5:1, a 500 angstrom/min barrier rate would give a 100 angstrom/min metal (copper) polishing rate, which is within the range cited.

As to claims 24-25, Tsai teaches a range of pH including 3-7 (col.7, lines 3-10). Since Tsai teaches a range, Tsai also teaches that the pH may be changed according to the desired polishing results. The pH affects the reaction kinetics. It would have been obvious to one with ordinary skill in the art to vary the pH to the range cited in the modified method of Tsai because the pH appears to reflect a result-effective variable which can be optimized. See MPEP 2144.05 IIB.

Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al (US 7,008,554 B2) in view of Scott (US 7,029,508).

The discussion of Tsai from above is repeated here.

As to claims 10 and 18, Tsai fails to disclose that the composition includes a two-carbon atom linkage alkanolamine compound. Scott teaches that a useful compound to enhance polishing of HDA (col.18, lines 23-27, 51-52) slurries is to include an alkanolamine (col.36, lines 29-32). It would have been obvious to include an alkanolamine with a two-carbon linkage in the method of Tsai because Scott teaches that they are useful to add to HDA polishing methods to enhance polishing. The method of Tsai modified by Scott would have been obvious because adding polishing enhancing agents for HDA polishing was recognized as part of the ordinary capabilities of one skilled in the art. Scott teaches enhancing agents for similar methods as Tsai, and adding polishing enhancing agents would have yielded the predictable result of enhancing polishing because of the similar chemistries involved.

Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al (US 7,008,554 B2) in view of Fang (US 6,347,978 B1).

The discussion of Tsai from above is repeated here.

Further as to claims 28-30, Tsai fails to disclose that the composition is substantially free of HDA. Fang teaches that in HDA compositions for polishing, that HDA additives include either HDA or derivatives of HDA including nitrate and sulfates salts (col.3, lines 14-27). Fang teaches a finite list of HDA or its derivatives. It would have been obvious to choose a salt such as HDA sulfate or HDA nitrate in method of Tsai because Fang teaches that they are useful

alternatives for HDA in polishing compositions. Still further, because Fang teaches a finite list of identified, predictable solutions, it is obvious to choose to try the sulfate and/or nitrate salts for the HDA polishing compositions of Tsai in order to provide effective polishing solutions.

Response to Amendment

The 35 USC 112, 2nd paragraph rejection is withdrawn since the term “substantially free of hydroxylamine” has been deleted.

Since the removal rates have been deleted from the independent claim, the reliance upon Sun and Fang has changed in the rejections, but Tsai remains as the primary reference in the 35 USC 103 rejection.

Response to Arguments

Applicant's arguments filed 10/2/08 have been fully considered but they are not persuasive. Applicant argues that claim 14 has been amended to recite features that antedate the teachings of Sun, Tsai and Fang and that the claim without barrier layer polishing is supported by the parent, 09/226,996. This is not persuasive because 09/226,996 is directed to polishing with an abrasive, not to polishing with less than 1% by weight abrasive (the instant specification's basis for "substantially free" of abrasive, [0089] of published application). Less than 1% abrasive finds basis in the instant specification, not in the parent, and thus Sun, Tsai and Fang are still relied upon in the rejection since they are not antedated.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anita K Alanko/
Primary Examiner, Art Unit 1792